There are other factors, however, in the working and design of jet condensers which have to be carefully considered. The supply of injection water is usually at a lower level than the point of injection, so as to remove the principal danger of the condenser and engine becoming accidentally flooded with water. The vacuum produced by the air-pumps is depended upon to inject the water, and therefore there are practical limits to the height the water may be raised by this means. The lift is not usually made more than 12 or 14 ft., but in special circumstances may be as much as 20 ft. In addition there is the resistance to the flow of the water through the pipes and injection valve, and this can be estimated approximately when particulars of the piping are available, but this resistance may be roughly taken to be about 4 ft. of water. Thus, if the vacuum is 27 in. of mercury, lift of water 12 ft., and pipe resistance 4 ft. of water, the head of water available for injection would be

$$\frac{27}{12} \times 13\text{-}6 - 12 - 4 = 14\text{-}6 \text{ ft. of water,}$$

where 13-6 is the specific gravity of mercury.

If each injection nozzle has a rounded entrance, the coefficient of discharge is nearly unity, and thus:

$$\frac{v^2}{2g} = 14\text{-}6,$$

where v is the maximum velocity of injection obtainable under these conditions, or

$v = x/2 \times 32\text{-}2 \times 14\text{-}6 = 30\text{-}7$ ft. per second.

If the steam condensed per hour is, say, 10,000 lb., and $\frac{W}{24\text{-}8}$ = 24-8 from the previous calculation, then

$W = 24\text{-}8 \times 10{,}000 = 248{,}000$ lb. water per hour,

$$\text{or, } \frac{248{,}000}{\ldots} = 4000 \text{ c. ft. per hour.}$$

Thus, if a is the area of the nozzles at the throat in

square feet,

3600 a X 307

0-0362

sq. ft. or, a

The size of each nozzle or orifice would depend to some extent upon the amount of foreign matter which might pass the " snore " pipe or strainer in the intake. If J in. diameter were adopted, the minimum number would be given by

$$n \text{ X } 0.25^2 \text{ x } \frac{\pi}{4} = 5.21,$$

or, n = 106.